UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

JUL 9 2009

# ACTION MEMORANDUM

**SUBJECT:** Request for a Removal Action at the Radiation-Standard Products, Sedgwick County, Kansas

**FROM:** Randy Schademann, On-Scene Coordinator
Planning and Preparedness North Section
Superfund Division

**THRU:** Mary Peterson, Chief
Planning and Preparedness North Section
Superfund Division

**TO:** Cecilia Tapia, Director
Superfund Division

| | |
|---|---|
| CERCLIS ID# | KSN000705966 |
| Site ID# | A7N1 |
| Category of Removal: | Time Critical |
| Nationally Significant/Precedent Setting: | No |

## I. PURPOSE

The purpose of this Action Memorandum is to request approval and funding for a fund-lead, time-critical removal action at the Radiation-Standard Products site (Site). Radiation-Standard Products is located at 650 East Gilbert Street, Wichita, Kansas. During a Removal Site Evaluation (RSE) conducted by the United States Environmental Protection Agency (EPA) in March 2009, it was determined that some radium-contaminated material from the Site had been moved to 920 South St. Francis, an adjacent residential parcel, which is the subject of this removal action.

As detailed below, the objective of this removal action is to protect public health or welfare or the environment by responding to the release of hazardous substances and pollutants or contaminants into the environment as presented by materials contaminated with radium-226 at 920 South St. Francis. Contaminated materials that exceed 5 pico Curies per gram (pCi/g) plus background will be excavated and properly containerized and stored until the removal action at

650 East Gilbert Street is performed. At the time of the removal, all materials contaminated with radium will be properly disposed of at a facility licensed to treat/dispose of radium-226.

Radium-contaminated materials have also been identified at the 650 East Gilbert Street property. A search for potentially responsible party or parties (PRPs) is ongoing; when the PRP search is completed, an Action Memorandum for removal/disposal of all materials contaminated with radium-226 will be issued.

## II. SITE CONDITIONS AND BACKGROUND

### A. Site Description

#### 1. Removal site evaluation

The Kansas Department of Health and Environment (KDHE) Bureau of Air and Radiation (BAR) licensed radium dial shops. According to BAR records, Standard Products operated a facility repairing aircraft instruments from approximately 1952 to 1965. By 1965, the facility had relocated to 4105 West Pawnee and changed its name to Standard Precision, Inc.

Radium in luminescent paints was widely used for aircraft dials, gauges, and other instruments. Radium dial repair shops were located in Wichita to upgrade and repair radium-bearing aircraft instruments. During this process, paint containing radium was stripped from the dials with solvent prior to the dials being repaired.

In an ongoing effort to evaluate these facilities, KDHE conducted field work in August, September, and December 2007 to support a Unified Focus Assessment (UFA) Report issued in February 2008. Five groundwater samples and 24 soil samples at 650 East Gilbert were collected for the UFA. Samples were analyzed for radium-226; the eight Resource Conservation and Recovery Act (RCRA) metals (which are lead, arsenic, barium, cadmium, chromium, mercury, selenium, and silver), and volatile organic compounds (VOCs). The UFA identified several areas that had elevated radium concentrations exceeding the standard established at 40 CFR § 192.12 for a cleanup level not to exceed background plus five pCi/g. (up to 81,800 pCi/g of radium-226). No samples were taken or field screening conducted at the 920 South St Francis parcel during the KDHE UFA.

EPA conducted field activities for a Removal Site Evaluation (RSE) in March and April of 2009. Field screening with radiation detectors and radiation analysis of soil samples further defined the vertical and aerial extent of contamination. Results of the field screening depicting areas showing radiation above background values are provided in Figure 1.

#### 2. Physical location and Site characteristics

The Site consists of three acres—the combined acreage of the 650 East Gilbert and 920 S. St. Francis parcels in Wichita, Sedgwick County, Kansas (Figure 1). The Gilbert parcel is largely vacant except for a metal building that is currently utilized for equipment storage by an electric company. The St. Francis parcel has a single family residence.

Both parcels are located in the Northwest ¼ of Section 28, Township 27 South, Range 1 East. The area surrounding the Site is primarily residential with some light industry and the Guadalupe Clinic, a health clinic, which borders both parcels.

### 3. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant

The primary contaminant of concern at this Site is radium-226. EPA and KDHE have documented radium-226 concentrations in soil exceeding 5 pCi/g plus background (up to 81,800 pCi/g on the Gilbert parcel and up to 495 pCi/g on the St. Francis parcel).

Radioluminescent paint—a mixture of a radionuclide, usually radium-226, and a phosphor, usually zinc sulfide—was developed in the early 1900s. The mixture was initially used on watch and clock faces and later adapted for use on instruments, most notably aircraft dials. As part of radium's decay process it emits an alpha particle that can excite the phosphor which eventually releases a photon. The end results are dials that "glow" and can be read at night without light.

Radium has 25 known isotopes, 4 of which occur in nature, with radium-226 and to a lesser extent radium-228 being the most common. Radium-226 has the longest half-life at 1,602 years. Radium is a decay product of uranium and consequently is associated with uranium ores. Radium decays by emitting alpha and beta particles and gamma rays. Radium initially decays into radon, a heavy gas, which itself decays into other radioactive solids including polonium, bismuth, lead, and thallium. Radium in soils does not biodegrade.

The residents at the St. Francis property or passersby at the East Gilbert parcel may be exposed via routes of inhalation or dermal contact to bricks that have been used to edge landscaping and a garden. The greatest risk to humans from radium is through ingestion of food and water documented by ATSDR, *Toxicological Profile for Uranium,* Section 5.5 (December 1990). Residents at the St. Francis property are exposed by consuming produce from their garden and being exposed to radium from the radium-contaminated bricks brought from the 650 E. Gilbert property.

Exposure to high levels of radium results in an increased incidence of bone, liver, and breast cancer. Radium, like calcium, is retained in bone tissue; bone cancer is the greatest risk from radium exposure. Death and decreased longevity have been reported as a result of long term exposure. Radium has also been shown to affect the blood (anemia), eyes (cataracts), and teeth (increased broken teeth and cavities). Emitted ionizing radiation from the decay of radium and its daughters can lead to skin damage, hair loss, birth defects, general illness, and cancer.

Radium-226 is a hazardous substance, as defined by section 101(14) of the CERCLA, and is listed at 40 CFR part 302.4 as radionuclides.

### 4. NPL status

The Site is not currently on NPL, nor is it proposed for listing on NPL.

### 5. Maps, pictures, and other graphic representations

Figure 1 (Site layout and screening results) is attached.

## B. Other Actions to Date

Activities pertaining to the Site include:

- 1953-55, 1959, and 1962 – Kansas State Board of Health inspections.
- 2007 – KDHE UFA
- 2009 – US EPA RSE.

There has been no known EPA or KDHE response action at this Site to reduce the risks posed by radium contamination.

## C. State and Local Authorities' Roles

On November 20, 2008, KDHE referred this Site to EPA for a response action. EPA is closely coordinating Site activities with KDHE and the Sedgwick County Health Department. The EPA requested that KDHE identify state ARARS on June 3, 2009, and KDHE responded on June 15, 2009. The Sedgwick County Health Department has volunteered to coordinate Site activities with the local governing bodies.

# III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

Section 300.415(b) of the National Contingency Plan (NCP) provides that EPA may conduct a removal action when it determines that there is a threat to human health or welfare or the environment based on one or more of the eight factors listed in section 300.415(b)(2). The factors that justify a removal action at the St. Francis parcel are outlined as follows:

**300.415(b)(2)(i) – Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, or pollutants, or contaminants.**

Analytical results from samples collected by EPA indicate that hazardous substances have been released into the environment. Radium-226 was identified in soils at 920 South St Francis up to 495 pCi/g.

Radium is highly radioactive; it is classified by EPA and the National Academy of Science as a known human carcinogen and is listed in 40 CFR § 302.4 as a hazardous substance (as radionuclides). Because radium is similar in structure to calcium, it tends to gravitate to boney tissue. Exposure to high levels of radium results in an increased incidence of bone, liver, and breast cancer. Radium has also been shown to affect the blood (anemia), eyes (cataracts), and teeth (increased broken teeth and cavities). Emitted ionizing radiation from the decay of radium and its daughters (nuclides undergo spontaneous disintegrations that release energy and

result in the transformation to a different atom) can lead to skin damage, hair loss, birth defects, general illness, and cancer. The greatest risk to humans from radium is through ingestion of food and water contaminated with radium. The two residents at this Site are exposed to radium in soils and in bricks surrounding the landscaping and their garden.

**300.415(b)(2)(iv) – High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.**

Radium has been detected in surface soils up to 495 pCi/g. Radium-contaminated soils may migrate via airborne dusts, surface runoff, percolation into groundwater, construction activity, children transporting soils/dusts into their homes after playing in the affected areas, and foot traffic into residences.

The half-life of radium-226 is 1,602 years. It is highly probably that the Site will undergo physical changes during that time which would allow increased exposure.

The greatest risk to humans from radium is through ingestion of food and water contaminated with radium. The two residents at this Site are exposed to radium in soils and in bricks surrounding the landscaping and their garden.

**300.415(b)(2)(v) – Weather conditions that may cause hazardous substances, pollutants or contaminants to migrate.**

Radium has been detected in surface soils up to 495 pCi/g. Radium-contaminated soils may migrate via airborne dusts at the residence at 920 South St. Francis Street.

## IV. ENDANGERMENT DETERMINATION

The actual release of a hazardous substance at the St. Francis parcel, if not addressed by implementing the response action selected in this Action Memorandum, presents an imminent and substantial endangerment to the health of the public that comes in contact with the Site and to public welfare and the environment.

## V. PROPOSED ACTIONS AND ESTIMATED COST

### A. Proposed Actions

#### 1. Proposed action description

SOIL/WASTE EXCAVATION, REMOVAL, AND REPLACEMENT

The discussion presented in the following two paragraphs is based upon a February 12, 1998, memorandum from Stephen Luftig, then Director of the Office of Superfund Remediation Technology Innovation (February 12, 1998, Directive number 9200.4-25).

Standards have developed for the cleanup of uranium mill tailings under Section 275 of the Atomic Energy Act, 42 U.S.C. § 2022, as amended by Section 206 of the Uranium Mill

Tailings Radiation Control Act of 1978 (UMCTRA), 42 U.S.C. § 7918, and regulations at 40 CFR § 192.12. Pursuant to the above, the purpose of these standards was to limit the risk from inhalation of radon decay products of houses built on land contaminated with tailings and to limit gamma radiation exposure to people utilizing the contaminated land.

Subpart B of 40 CFR 192.12 lists two standards as cleanup levels for surface and subsurface soils. The cleanup level is not to exceed background level, plus the following:

(1) 5 pCi/g of radium-226 for surface soils which is a health-based standard. The basis for the standard is the health risk caused by exposure to gamma radiation.

(2) 15 pCi/g of radium-226 for subsurface soils which is not a health-based standard, but rather was developed for use in field measurements, rather than laboratory analyses, to determine when buried tailings had been detected.

Because the soil contamination on the St. Francis parcel is relatively shallow, mimicking the mill waste for which UMTRCA was developed, the 5 pCi/g plus the background concentration will be used throughout the Site. A background concentration of 1.87 piC/g was developed as the mean of samples collected by KDHE and EPA for an action level of 6.87 piC/g.

All site-sampling activities for comparison to the action levels will be conducted in accordance with the approved Quality Assurance Project Plan.

After removing the soils from the affected area, the excavated soils will be replaced with clean soils. Clean soils are soils that have been analyzed for radium, with results indicating that the concentration is at or below the background and that all other hazardous substances, pollutants, or contaminants are below residential soil screening levels as determined by EPA, or as referenced in the Region 9 Preliminary Remediation Goal tables found at *http://www.epa.gov/Region9/waste/sfund/prg/index.htm*, or as outlined in the KDHE RSK Manual, Version 4, 2007. The relevant pages may be found in the Administrative Record for this Site. Areas currently vegetated will be replaced with sod.

The excavated soil will be stored on the Gilbert parcel until the responsible party search is completed. If a viable responsible party is identified, the soil excavated from the St. Francis parcel will be included in the administrative order for a removal action. In the event a viable responsible party is not identified, transportation and disposal of the soil will be completed by EPA and will be in accordance with all applicable local, state, and federal requirements.

At this time, no post removal Site control will be necessary.

**2. Contribution to remedial performance**

The fund-lead actions proposed in this Action Memorandum should not impede any future remedial plans or other response.

### 3. Applicable or relevant and appropriate requirements (ARARs)

Section 300.415(j) of the NCP provides that fund-financed removal actions under section 104 shall, to the extent practicable considering the exigencies of the situation, attain ARARs under federal environmental or state environmental facility siting laws. The following specific ARARs have been identified for this action:

**Federal ARARs**

- Occupational Safety and Health Act Standards at 29 CFR part 1910 will be applicable to all actions.

- Department of Transportation (DOT) Regulations at 49 CFR parts 107 and 171-177, DOT hazardous material transportation regulations, may be relevant and appropriate for transportation of the contaminated soils.

- The CERCLA Off-Site Rule promulgated pursuant to CERCLA section 121(d)(3), 42 U.S.C. § 9621(d)(3), and formally entitled "Amendment to the National Oil and Hazardous Substances Pollution Contingency Plan; Procedures for Planning and Implementing Off-Site Response Action: Final Rule," 58 Fed. Reg. 49200 (Sept. 22, 1993), codified at 40 CFR § 300.440.

- Section 275 of the Atomic Energy Act, 42 U.S.C. § 2022, as amended by Section 206 of the Uranium Mill Tailings Radiation Control Act of 1978 (UMCTRA), 42 U.S.C. § 7918; 40 CFR part 192, as previously described in Section V (Proposed Actions).

- 10 CFR part 61, particularly 10 CFR §§ 61.7(a)(2), -61.41, -61.56, -61.81, Substantive requirements of the Licensing Requirements for Land Disposal of Radioactive Waste

**State ARARs**

The EPA is currently evaluating KDHE's response to a request for state ARARs and will be addressed during the removal as deemed appropriate.

### 4. Project schedule

Response activities are anticipated to begin within 30 days of the signing of this Action Memorandum. It is anticipated that the project will require approximately 21 days to complete.

### B. Estimated Costs

The costs associated with this portion of the Standard Products removal action are estimated as follows:

Extramural Costs:

| | |
|---|---|
| Removal Costs | $37,500 |
| 20% Contingency | 7,500 |
| Removal Ceiling | $45,000 |

**EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Refer to the enforcement section for a breakout of these costs.**

## VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delayed action will result in a continued threat to public health or welfare or the environment.

## VII. ENFORCEMENT

See attached Confidential Enforcement Addendum for this Site. For NCP consistency purposes, it is not a part of this Action Memorandum.

The total EPA costs for this removal action based on full cost-accounting practices are estimated to be

| | |
|---|---|
| Direct Extramural Costs | $45,000 |
| Direct Intramural Costs | 5,000 |
| EPA Indirect (38.57% of all costs) | 19,285 |
| Total Project Costs | $69,285 |

**Direct costs include direct extramural and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost-accounting methodology effective October 2, 2000. These estimates do not include prejudgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States' right to cost recovery.**

## VIII. OUTSTANDING POLICY ISSUES

None.

## IX. RECOMMENDATION

This decision document represents the selected removal action for addressing the hazardous substances, pollutants, or contaminants present at the Site. The removal action was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based on the Administrative Record for the Site.

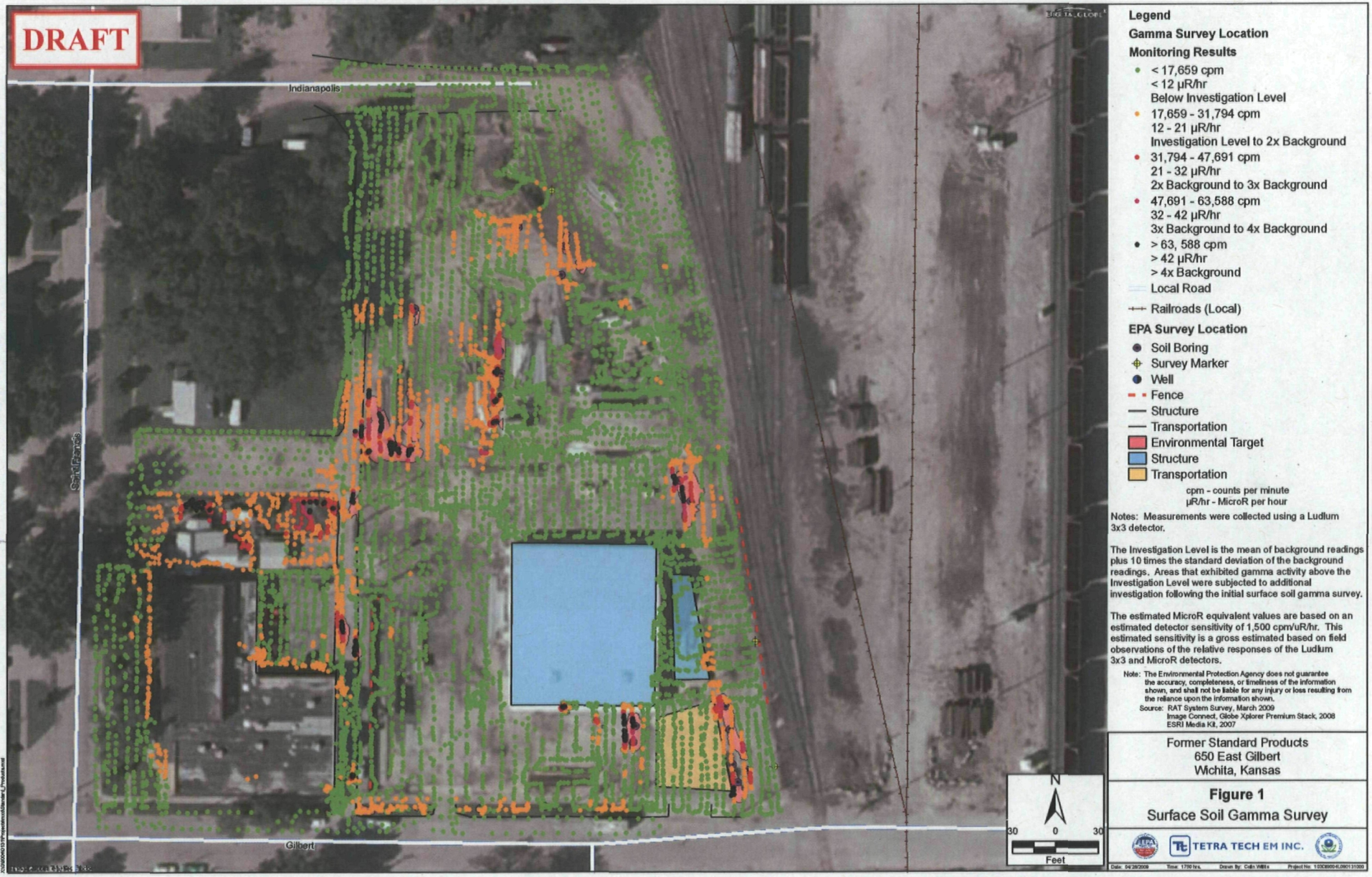
Conditions at the Site meet NCP section 300.415(b) criteria for a removal action, and I recommend your approval of this proposed removal action. The removal ceiling, if approved, will be $45,000. This amount comes from the Regional Removal Allowance.

Approved:

Cecilia Tapia, Director
Superfund Division

7/9/09
Date

Attachments:
Figure 1: Site Layout and Gamma Survey Results
Confidential Enforcement Addendum




920 S
S4 —
Francis